



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/087,915

03/05/2002

Yoshiyuki Tonami

36856.636

6607

7590

10/28/2003

KEATING & BENNETT LLP

Suite 312

10400 Eaton Place

Fairfax, VA 22030

EXAMINER

NADAV, ORI

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/087,915

Applicant(s)

TONAMI ET AL.

Examiner

ori nadav

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8, 10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8, 10 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 2, 4-8, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Sano (5,190,892) and Dohya (4,665,468).

Regarding claims 5, 2 and 10, AAPA teaches in figure 8 and related text a method of producing a high frequency circuit chip having a substrate 51 made of a ceramic with a high dielectric constant, a wiring pattern 52 provided on one main surface of the substrate and the wiring pattern 56 disposed on substantially all of the back main surface of the substrate 51, and a through-hole 57b Including a connecting electrode 60 for connecting the wiring pattern and the conductor layer to each other, the method comprising the steps of: Filling electrically conductive paste 60 into a perforation in the substrate, and firing the paste to form the connecting electrode of the through-hole; forming a thin film 52 with a wiring material directly on the substrate and removing the unnecessary wiring material thin film to form the wiring pattern directly on the substrate.

AAPA does not teach the method of forming the wiring pattern on a mirror-polished substrate.

Art Unit: 2811

Sano teaches in figure 1 and related text forming a resist pattern 33 with an opening having a desired shape and size on the substrate; forming a thin film 35 with a wiring material directly on the substrate through the opening over the resist pattern after forming the resist pattern; and removing the unnecessary wiring material thin film 35 deposited on the resist pattern together with the resist pattern to form the wiring pattern 35a directly on the substrate by a lift-off method.

Dohya teaches mirror-polishing at least the surface of the fired substrate on which the wiring pattern is formed, and the fired substrate in which the through-hole having the connecting electrode is formed, before forming the wiring pattern on the mirror-polished surface (column 4, lines 52-55)..

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Sano's method of forming the wiring pattern in AAPA's device on a mirror-polished substrate, as taught by Dohya, in order to improve the electrical characteristics of the chip by providing more accurate controllable wiring pattern and by preventing damage to the substrate, and in order to prevent the undulation of the surface of the substrate, respectively. The combination is motivated by the teachings of AAPA who point out the disadvantages of using the method of forming the wiring pattern, by the teachings of Sano who points out the advantages of using a lift off method, and by the teachings of Dohya who points out the advantages of using a mirror-polished substrate (column 4, lines 45-55), respectively.

Art Unit: 2811

Regarding claim 4, AAPA teaches in figure 8 forming a thin-film resistor pattern 55 which is connected to the wiring pattern.

Regarding claim 6, AAPA teaches a ceramic substrate having a relative dielectric constant of at least about 10.

Regarding claims 7, 8 and 12, AAPA teaches the wiring pattern formed on at least one main surface of the substrate and the electric conductor layer formed on substantially all of the other main surface by a conductor pattern containing at least one metal selected from the group consisting of AG, Cu, and Al as a major component and having a thickness of at least about 2 microns, wherein a connecting electrode of the through-hole is formed by including at least one metal selected from the group consisting of AG, Cu, and Al as a major component.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA), Sano and Dohya, as applied to claim 1 above, and further in view of Kitamura (5,480,048).

AAPA and Sano teach substantially the entire claimed structure, as applied to claim 1 above, except forming a protection film so as to cover the wiring pattern and cutting the substrate along desired dicing lines to obtain the high frequency circuit.

Art Unit: 2811

Kitamura et al. teach in figure 9e forming a protection film 905 so as to cover the wiring pattern on the substrate. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form a protection film so as to cover the wiring pattern on the substrate, and to cut the substrate along desired dicing lines to obtain the high frequency circuit in order to protect the wiring pattern and to obtain an operative device, respectively.

Response to Arguments

3. Applicant's arguments with respect to claims 2-8, 10 and 12 have been considered but are moot in view of the new ground(s) of rejection.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Art Unit: 2811

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

A handwritten signature in black ink, appearing to read 'Ori Nadav', with a stylized, flowing script.

O.N.
October 24, 2003

ORI NADAV
PATENT EXAMINER
TECHNOLOGY CENTER 2800